

REMARKS

Status of the Claims

Claims 1-22 are pending in this application.

Claims 1, 2, 5-7, 9, 12-15, and 18 are rejected.

Claims 3, 4, 10, 11, 16 and 17 are objected to.

Claims 8 and 19-22 have been allowed.

Rejection of Claims 1, 5-7, 12, 13, 14 and 18 Under 35 U.S.C. § 102(b)

Claims 1, 5-7, 12, 13, 14 and 18 stand rejected under 35 U.S.C. §102(b) as being clearly anticipated by U.S. Patent No. 5,373,206 issued to Lim (hereafter Lim).

The Office Action indicated that Lim discloses:

[a]s to claims 1 and 14, Lim discloses a position detection apparatus including a single sensor element (100, fig 4), said single sensor element (100) providing a sensor signal that varies with the measured parameter; a first output circuit (300) responsive to the sensor signal and providing a first output signal; and a second output circuit (500) responsive to the sensor signal and providing a second output signal, wherein the first and second output signals are two of multiple outputs from the sensor element (100) and wherein system diagnostics are performed without two or more sensors (col. 3, line 35 – col. 4, line 31). As to claims 5 and 12, Lim discloses that the sensor element is an inductive sensor (col. 4, lines 32-34). As to claims 6, 7, 13, and 18, Lim discloses that the sensing system monitors the condition of a parameter or component in a vehicle (col. 3, lines 35-44).

Applicant now respectfully traverses the rejection of claims 1, 5-7, 12, 13, 14, and 18, and maintains that Lim does not disclose every element of claims 1, 5-7, 12, 13, 14, and 18.

Applicant submits that claim 1 discloses “a single sensor element, said single sensor element providing a sensor signal that varies with the measured parameter, a first output circuit responsive to the sensor signal and providing a first output signal, and

a second output circuit responsive to the sensor signal and providing a second output signal, wherein the first and second output signals are two of multiple outputs from the sensor element.” Applicant submits that Lim does not disclose the limitations of “a single sensor element, said single sensor element providing a sensor signal that varies with the measured parameter” or how “the first and second output signals are two of multiple outputs from the sensor element.” Lim discloses a “sensing unit 100 which is comprised of a sensing disc 13 coupled to a shaft so as to be rotated with the rotor 11.” Col. 4, 32-34. Lim also discloses how the “sensing disc 13 has a single sensor S mounted at a position spaced at a predetermined phase advance angle [[sic]] from a phantom line that is a center line on which the rotor 11 is aligned with the stator 12. The sensor S is adapted to generate a clock pulse of one cycle every time when one phase is excited.” Col. 4, Lines 36-41. The single sensor disclosed in Lim does not disclose how the sensor S has two output signals which are multiple outputs from the sensor element as disclosed in the present invention; the sensor S disclosed in Lim is used to generate one type of signal only. For this reason alone, Lim does not anticipate claim 1 of the present invention.

Additionally, the single sensor disclosed in the Lim reference does not provide a signal that varies with a measured parameter the way the sensor disclosed in claim 1 does. The sensing unit in Lim is “provided with a single sensor for detecting a position of a rotor and adapted to output a clock pulse of one period upon every phase excitation as a position detection signal.” Col. 3, Lines 36-39. The sensor disclosed in the Lim reference is used to generate a clock pulse signal every time the rotor rotates. The signal disclosed in the Lim reference does not vary, and does not provide a sensor signal, as disclosed in claim 1 of the present invention.

Claims 5-7 contain the limitations of “a single sensor element, said single sensor element providing a sensor signal that varies with the measured parameter” and how “the first and second output signals are two of multiple outputs from the sensor element,” which are not disclosed by Lim. Thus claims 5-7 are likewise allowable. Applicant respectfully requests the removal of the rejections for claims 5-7.

With regard to the rejection of claims 12 and 13, Applicant points out that claims 12 and 13 are dependent upon claim 9. Claims 12 and 13 disclose “a single sensor element for sensing the parameter, said single sensor element providing a sensor signal” as well as “a first output circuit responsive to the sensor signal from the shared circuits, said first output circuit providing a first output signal; and a second output circuit responsive to the sensor signal from the shared circuits, said second output circuit providing a second output signal, wherein the first and second output signals are multiple outputs from the sensor element.” Lim does not disclose this limitation, Lim discloses a “sensing unit 100 which is comprised of a sensing disc 13 coupled to a shaft so as to be rotated with the rotor 11.” Col. 4, 32-34. Lim also discloses how the “sensing disc 13 has a single sensor S mounted at a position spaced at a predetermined phase advance angle [[sic]] from a phantom line that is a center line on which the rotor 11 is aligned with the stator 12. The sensor S is adapted to generate a clock pulse of one cycle every time when one phase is excited.” Col. 4, Lines 36-41. The single sensor designated S in the Lim reference does not disclose how “the first and second output signals are multiple output from the sensor element” as disclosed in claims 12 and 13 of the present invention.

Also, the single sensor disclosed in the Lim reference does not provide “a single sensor element providing a sensor signal” as required by claims 12 and 13. The sensing unit in Lim is “provided with a single sensor for detecting a position of a rotor

and adapted to output a clock pulse of one period upon every phase excitation as a position detection signal.” Col. 3, Lines 36-39. The sensor S in the Lim reference generates a clock pulse, it does not sense a parameter as disclosed in claims 12 and 13 of the present invention. Removal of this rejection is respectfully requested.

With regard to the rejection of claim 14, Applicant submits that claim 14 discloses “a method for sensing a parameter, said method comprising: sensing the parameter with a single sensor element and providing a sensor signal indicative of the parameter,” and applying the sensor signal to a second output circuit, said second output circuit providing a second output signal indicative of the sensed condition, wherein the first and second output signals are two of multiple outputs from the sensor element.” Lim does not disclose these limitations. Lim discloses a “sensing unit 100 which is comprised of a sensing disc 13 coupled to a shaft so as to be rotated with the rotor 11.” Col. 4, 32-34. Lim also discloses how the “sensing disc 13 has a single sensor S mounted at a position spaced at a predetermined phase advance angle [[sic]] from a phantom line that is a center line on which the rotor 11 is aligned with the stator 12. The sensor S is adapted to generate a clock pulse of one cycle every time when one phase is excited.” Col. 4, Lines 36-41. The single sensor S disclosed in Lim does not disclose how first and second output signals are two of multiple outputs from the sensor element as disclosed in claim 14 of the present invention. The sensor S disclosed in Lim generates only a single output signal.

In addition, the single sensor disclosed in the Lim reference does not provide “a single sensor element and providing a sensor signal indicative of the parameter” as disclosed in claim 14 of the present invention. The sensing unit in Lim is “provided with a single sensor for detecting a position of a rotor and adapted to output a clock pulse of one period upon every phase excitation as a position detection signal.” Col. 3, Lines

36-39. The sensor disclosed in the Lim reference is used to generate a clock pulse signal, and does not vary while being used to sense a parameter, and does not provide a sensor signal, as disclosed in claim 14 of the present invention.

With regard to the rejection of claim 18, claim 18 contains the limitations of “a single sensor element and providing a sensor signal indicative of the parameter,” and “the first and second output signals are two of multiple outputs from the sensor element,” which are not disclosed by Lim. Applicant respectfully requests the removal of the rejections for claim 18.

Rejection of Claims 2, 9 and 15 Under 35 U.S.C. § 103(a)

The Office Action indicated that claims 2, 9, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lim in view of U.S. patent 5,136,880 issued to Norgauer (hereafter Norgauer). In order for the proposed references to be relied upon, a person having ordinary skill in the art at the time of the invention must have been motivated to modify the references based upon the teachings of those references.

The Office Action stated:

[a]s to claims 2, 9, and 15, Lim fails to show shared circuits coupled to the sensor element and the first and second output circuits, the shared circuits including circuit elements used by both the first and second output circuits. Norgauer discloses an arrangement for detecting a changing operating parameter including shared circuits (34, 36, fig. 1) coupled to the sensor element (16) and the first and second output circuits (28, 30), the shared circuits (34, 36) including circuit elements used by both the first and second output circuits (28, 30). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Lim with the teachings of Norgauer to include shared circuits to be used by sensor element and first and second output circuits to reduce the size of the device by reducing the number of components.

Claim 2 contains the limitation of “a single sensor element, said single sensor element providing a sensor signal that varies with the measured parameter, a first

output circuit responsive to the sensor signal and providing a first output signal, and a second output circuit responsive to the sensor signal and providing a second output signal, wherein the first and second output signals are two of multiple outputs from the sensor element.”

Lim does not teach or suggest these limitations. Lim teaches a “sensing unit 100 which is comprised of a sensing disc 13 coupled to a shaft so as to be rotated with the rotor 11.” Col. 4, 32-34. Lim also teaches how the “sensing disc 13 has a single sensor S mounted at a position spaced at a predetermined phase advance angle [[sic]] from a phantom line that is a center line on which the rotor 11 is aligned with the stator 12. The sensor S is adapted to generate a clock pulse of one cycle every time when one phase is excited.” Col. 4, Lines 36-41. The Lim reference does not teach or suggest how the sensor S has two output signals which are multiple outputs from the sensor element as taught by the present invention; the sensor S as taught by Lim is used to generate one type of signal only. For this reason alone, Lim does not teach or suggest the limitations of claim 2 of the present invention.

Also, the sensing unit in Lim is “provided with a single sensor for detecting a position of a rotor and adapted to output a clock pulse of one period upon every phase excitation as a position detection signal.” Col. 3, Lines 36-39. The sensor as taught by the Lim reference is used to generate a clock pulse signal every time the rotor rotates. The signal taught in the Lim reference does not vary, and does not provide a sensor signal, as taught by claim 2 of the present invention.

With regard to Norgauer, Norgauer teaches how the “arrangement according to the present invention provides that the characteristics of the at least two measuring devices for detecting the operating parameter are linear over the value range of the operating parameter at least outside of the extreme value ranges.” Col. 1, Lines 40-45.

Norgauer also teaches how the “arrangement 14 includes at least two position measuring devices (16 and 18) which are referred to the following as sensors.” Col. 2, Lines 55-57. Norgauer does not teach “the first and second output signals are two of multiple outputs from the sensor element” as taught by the present invention. The sensors as taught by Norgauer are position sensing devices and are used for only one type of output.

Also, Norgauer does not teach “a single sensor element, said single sensor element providing a sensor signal that varies with the measured parameter” as taught by claim 2 of the present invention. Norgauer teaches how the “arrangement according to the present invention provides that the characteristics of the at least two measuring devices (16 and 18) which are referred to as sensors.” Col. 2, Lines 55-57. Therefore, nothing in the specification or drawings of Norgauer teaches or suggests the limitations of claim 2 of the present invention.

For all of the above reasons, applicant believes that the combination of Lim in view of Norgauer does not teach or suggest all of the limitations of claim 2. Therefore, removal of the rejection of claim 2 is respectfully requested.

With regard to claim 9, claim 9 teaches “A sensing system for monitoring a parameter of a vehicle, said system comprising: a single sensor element for sensing the parameter, said single sensor element providing a sensor signal” as well as “a first output circuit responsive to the sensor signal from the shared circuits, said first output circuit providing a first output signal; and a second output circuit responsive to the sensor signal from the shared circuits, said second output circuit providing a second output signal, wherein the first and second output signals are multiple outputs from the sensor element.” As stated above, Lim does not teach or suggest these limitations.

Norgauer does not fill the gap left by Lim. Norgauer teaches how the “arrangement according to the present invention provides that the characteristics of the at least two measuring devices for detecting the operating parameter are linear over the value range of the operating parameter at least outside of the extreme value ranges.” Col. 1, Lines 40-45. Norgauer does not teach how “the first and second output signals are multiple outputs from the sensor element” as taught by claim 9 of the present invention.

Furthermore, Norgauer does not teach “a single sensor element for sensing the parameter, said single sensor providing a sensor signal” as taught by claim 9. Norgauer also teaches how the “arrangement 14 includes at least two position measuring devices (16 and 18) which are referred to the following as sensors.” Col. 2, Lines 55-57. The “arrangement” as taught by Norgauer does not incorporate “a single sensor element” as taught by claim 9. Therefore, nothing in the specification or drawings teaches or suggests the limitations of claim 9 of the present invention.

For all of the above reasons, Applicant believes that the combination of Lim in view of Norgauer does not teach or suggest all the limitations of claim 9. Therefore, removal of the rejection of claim 9 is respectfully requested.

With regard to claim 15, Applicant notes that claim 15 contains the limitation of a “method of sensing a parameter, said method comprising: sensing the parameter with a single sensor element and providing a sensor signal indicative of the parameter” and “applying the sensor signal to a second output circuit, said second output circuit providing a second output signal indicative of the sensed condition, wherein the first and second output signals are two of multiple outputs from the sensor element.” As discussed above, Lim does not teach these limitations, therefore, Norgauer must teach these limitations, or the rejection will fall.

Norgauer teaches how the “arrangement according to the present invention provides that the characteristics of the at least two measuring devices for detecting the operating parameter are linear over the value range of the operating parameter at least outside of the extreme value ranges.” Col. 1, Lines 40-45. The “at least two position measuring devices” taught by Norgauer show the invention in Norgauer does not incorporate a single position measuring device or sensor. Therefore, Norgauer does not teach a “single sensor element” according to claim 15 as taught by the present invention.

Additionally, Norgauer does not teach “sensing the parameter with a single sensor element and providing a sensor signal indicative of the parameter” as taught by claim 15. Norgauer teaches how the “arrangement 14 includes at least two position measuring devices (16 and 18) which are referred to the following as sensors.” Col. 2, Lines 55-57. Therefore, nothing in the specification or drawings of Norgauer teaches or suggests the limitations of claim 15 of the present invention.

For the above stated reasons, Applicant believes that the combination of Lim in view of Norgauer does not teach or suggest all of the limitations of claim 15. Therefore, removal of the rejection of claim 15 is respectfully requested.

Since Lim in view of Norgauer does not teach or suggest all of the elements of claims 2, 9, and 15, Applicant respectfully requests removal of the rejection of claims 2, 9, and 15 and allowance thereof.

Allowable Matter

Claims 8 and 19-22 have been allowed. Applicant kindly thanks Examiner for allowing these claims. In addition, the Office Action indicated that claims 3, 4, 10, 11,

16, and 17 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

CONCLUSION

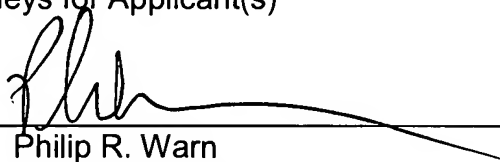
It is respectfully submitted that in view of the above amendments and remarks the claims 1, 2, 5-7, 9, 12, 13, 14, 15, and 18 as presented, are patentably distinguishable because the cited patents, whether taken alone or in combination, do not teach, suggest or render obvious, the present invention. Therefore, Applicant submits that the pending claims are properly allowable, which allowance is respectfully requested.

The Examiner is invited to telephone the Applicant's undersigned attorney at (248) 364-4300 if any unresolved matters remain.

Respectfully submitted,

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